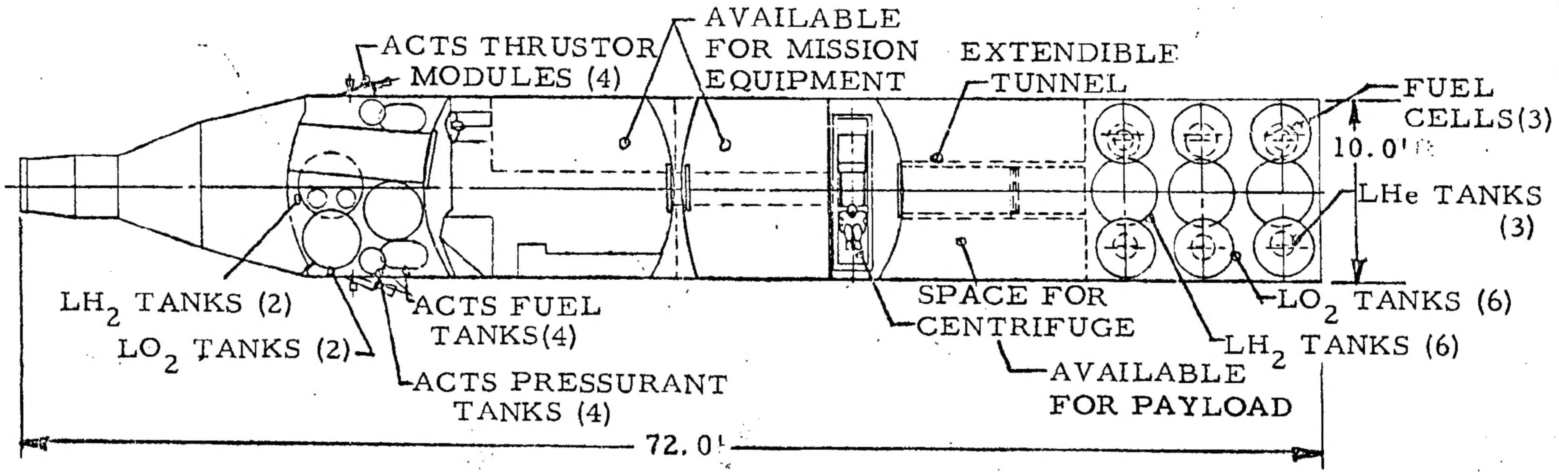
ETR

INTEGRAL LAUNCH DUAL COMPARTMENT LABORATORY

(CONFIGURATION AND PERFORMANCE)

- CONFIGURATION

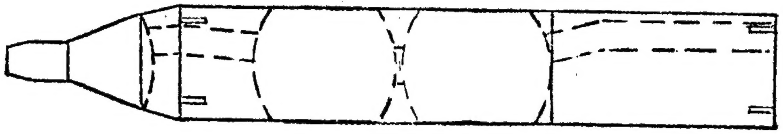


- PERFORMANCE

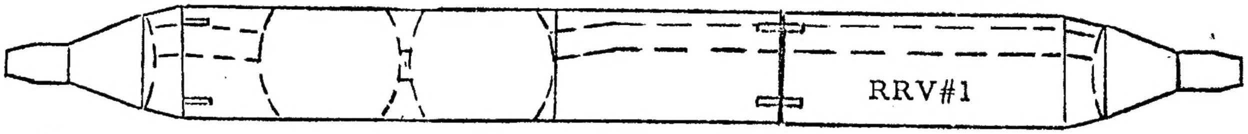
TOTAL PRESSURIZED VOLUME (SHIRT SLEEVE ENVIRONMENT)	2,000 FT^3
AVAILABLE PRESSURIZED VOLUME FOR CREW	1,200 FT^3
AVAILABLE PRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	600 FT^3
AVAILABLE UNPRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	~ 700 FT^3
EXPERIMENT PAYLOAD CAPACITY (ETR, i = 28.5°, 180 N M CIR)	~5,500 LB
(WTR, i = 80°, 180 N M CIR)	~1,000 LB
ELECTRICAL POWER (AVERAGE)	1,650 WATTS*
MISSION DURATION	90 DAYS

*INCLUDES 200 WATTS FOR EXPERIMENTS

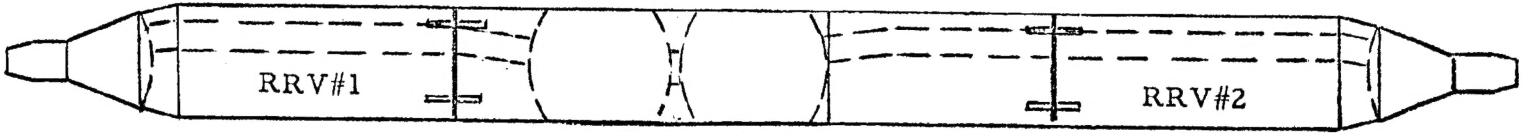
4 MAN DUAL COMPARTMENT LABORATORY



- INITIAL LAUNCH CONFIGURATION (2 MAN OPS)



- FIRST RENDEZVOUS RESUPPLY (4 MAN OPS)



- ON-ORBIT CONFIGURATION (4 MAN OPS)

RRV FUNCTIONS

- ACTS PROPULSION
- PRIME ELECTRICAL POWER
- LIFE SUPPORT EXPENDABLES
- EXPERIMENTS
- SPARE EQUIPMENT

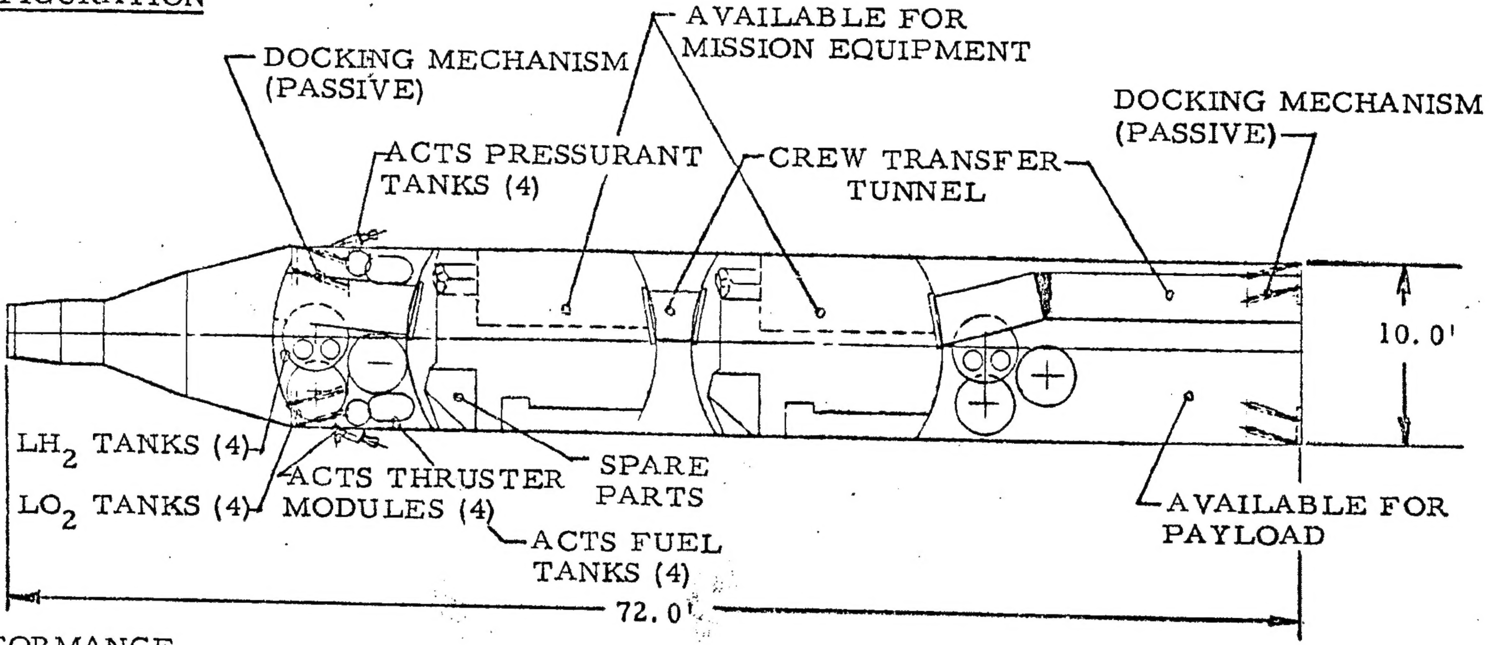
LABORATORY FUNCTIONS

- LIFE SUPPORT/ENVIRONMENTAL CONTROL
- ACTS - REFERENCE
- COMMUNICATIONS/DATA
- BIO-MEDICAL EQUIPMENT
- EXPERIMENTS

4 MAN DUAL COMPARTMENT LABORATORY

(CONFIGURATION AND PERFORMANCE)

- CONFIGURATION


AVAILABLE FOR MISSION EQUIPMENT
DOCKING MECHANISM (PASSIVE)
DOCKING MECHANISM (PASSIVE)
ACTS PRESSURANT TANKS (4)
CREW TRANSFER TUNNEL
10.0'
LH_2 TANKS (4)
LO_2 TANKS (4)
ACTS THRUSTER MODULES (4)
SPARE PARTS
ACTS FUEL TANKS (4)
AVAILABLE FOR PAYLOAD
72.0'

- PERFORMANCE

TOTAL PRESSURIZED VOLUME (SHIRT SLEEVE ENVIRONMENT)	2,000 FT^3
AVAILABLE PRESSURIZED VOLUME FOR CREW	1,200 FT^3
AVAILABLE PRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	600 FT^3
AVAILABLE UNPRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	950 FT^3
EXPERIMENT PAYLOAD CAPACITY (WTR, $i = 80^{\circ}$, 180 N M CIR)	5,700 LBS
ELECTRICAL POWER (AVERAGE)	2,000 WATTS*
RESUPPLY CYCLE	60 DAYS

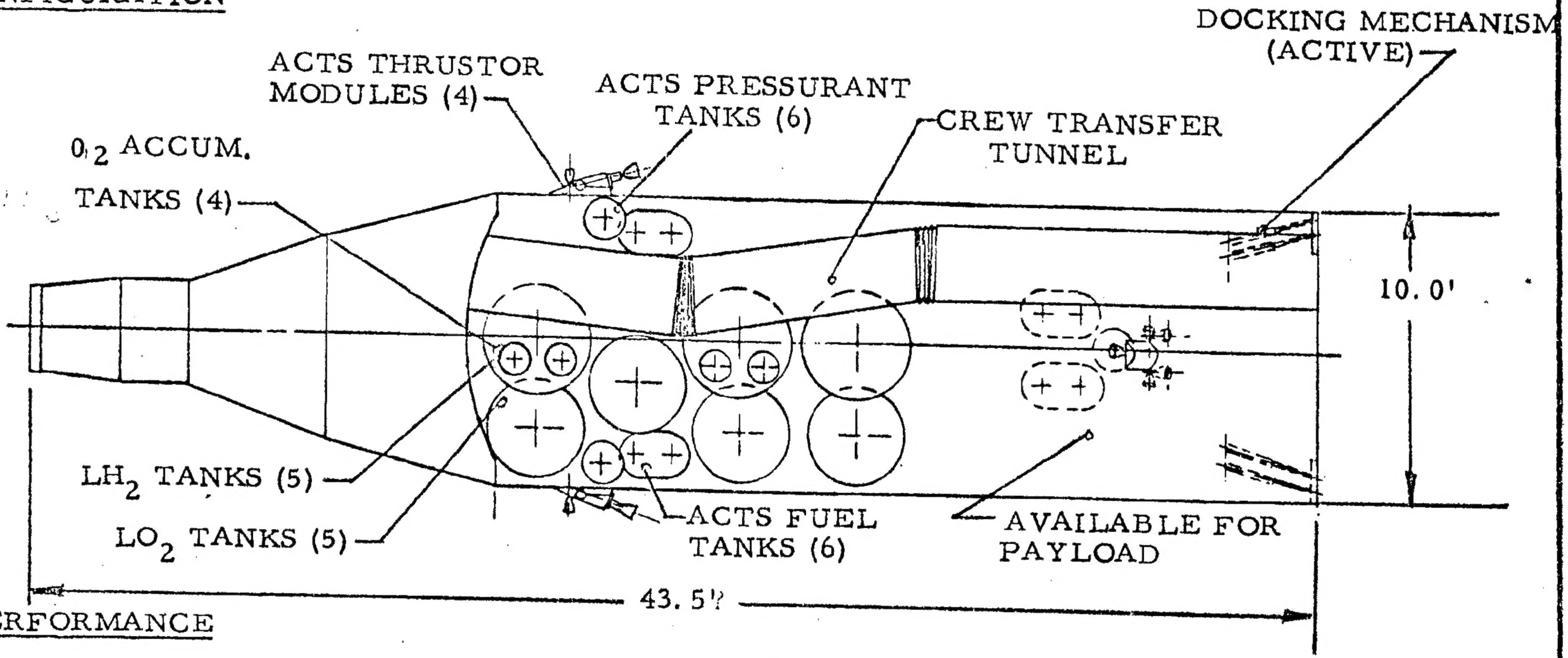
* 200 WATTS AVAILABLE FOR EXPERIMENTS

D ~~SECRET~~ SPECIAL HANDLING

RENDEZVOUS RESUPPLY VEHICLE

(CONFIGURATION AND PERFORMANCE)

o CONFIGURATION



o PERFORMANCE

UNPRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	2,000 FT^3
EXPERIMENT PAYLOAD CAPACITY (WTR, $i = 80^\circ$, 180 N M CIR)	10,000 LBS
ELECTRICAL POWER (AVERAGE)	2,000 WATTS*
RESUPPLY CYCLE (TO SUPPLY 4 MAN CREW)	60 DAYS

*200 WATTS AVAILABLE FOR EXPERIMENTS

D ~~SECRET~~ SPECIAL HANDLING

9/16/66

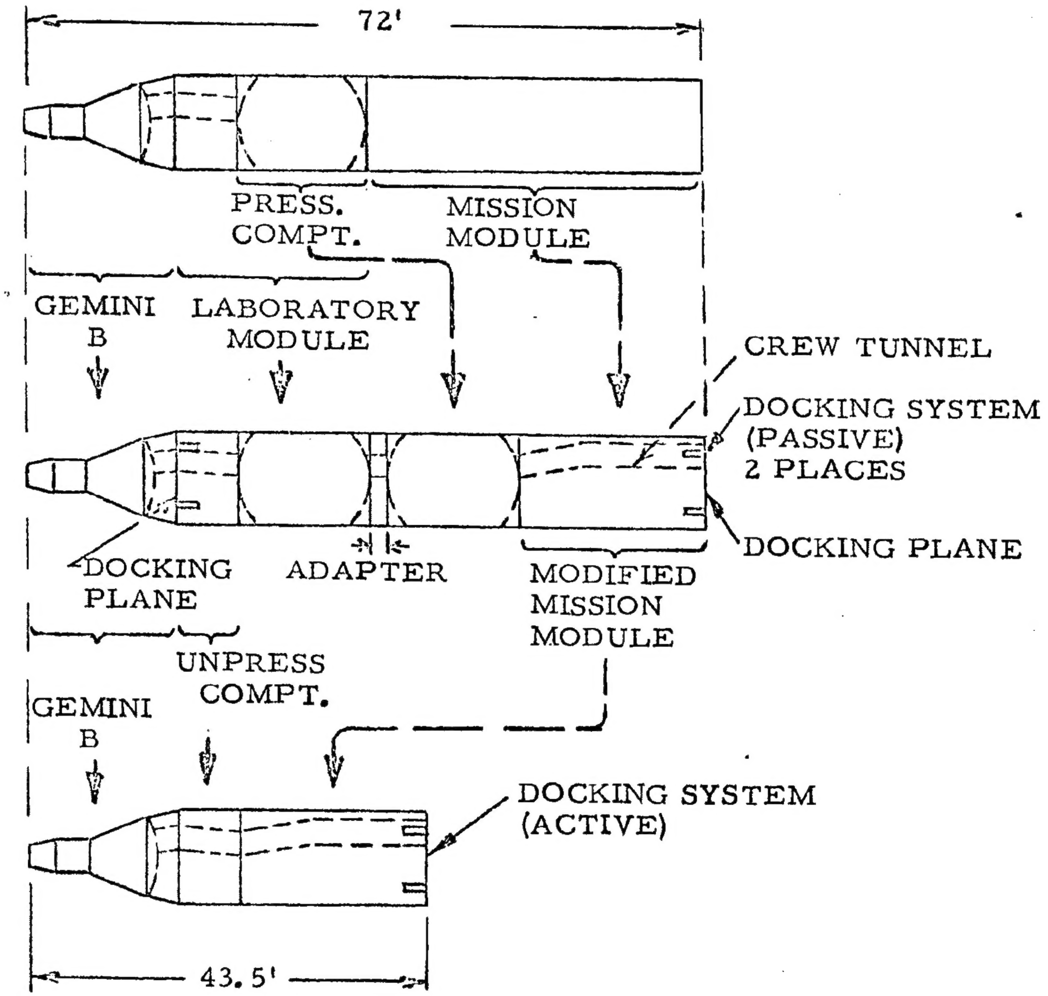
D ~~SECRET~~ SPECIAL HANDLING

UTILIZATION OF MOL HARDWARE FOR 4 MAN DUAL COMPARTMENT LABORATORY CONFIGURATION

○ MOL BASELINE VEHICLE

○ RENDEZVOUS INITIAL VEHICLE (RIV)

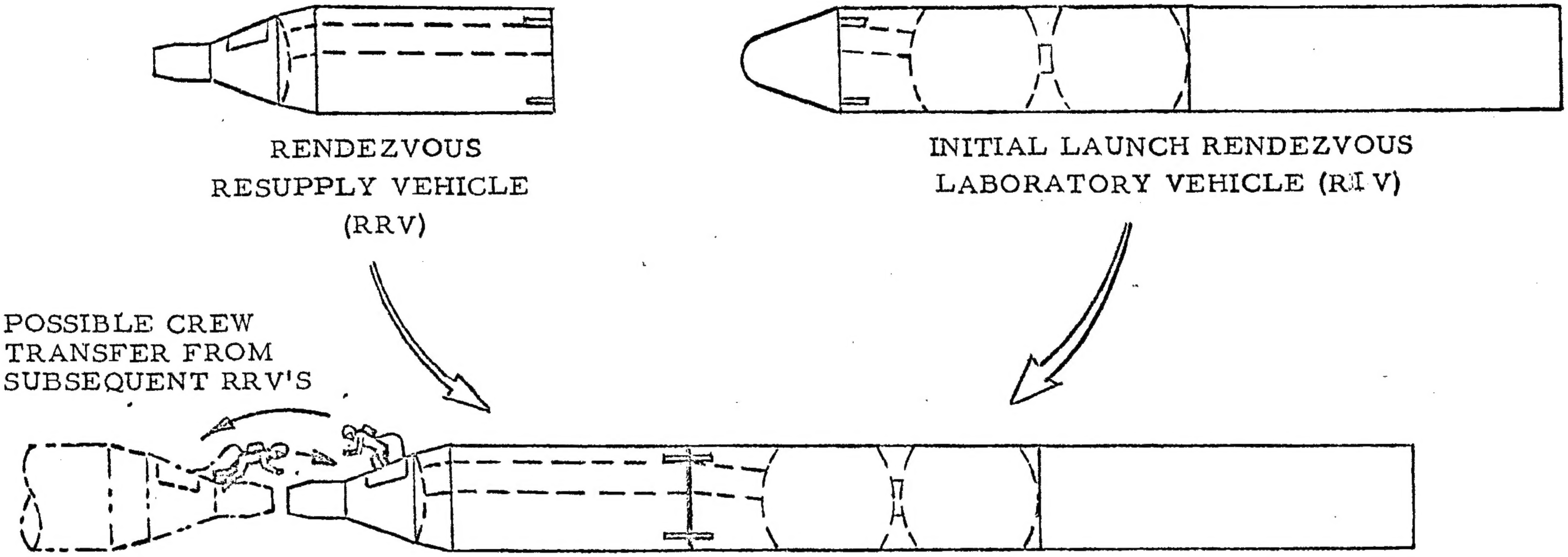
○ RENDEZVOUS RESUPPLY VEHICLE (RRV)



D ~~SECRET~~ SPECIAL HANDLING

2 MAN DUAL COMPARTMENT LABORATORY CONFIGURATION

(COMBINED MISSION)



RENDEZVOUS
RESUPPLY VEHICLE
(RRV)

INITIAL LAUNCH RENDEZVOUS
LABORATORY VEHICLE (RIV)

POSSIBLE CREW
TRANSFER FROM
SUBSEQUENT RRV'S

RENDEZVOUS ORBITING VEHICLE
(ROV)

RRV FUNCTIONS

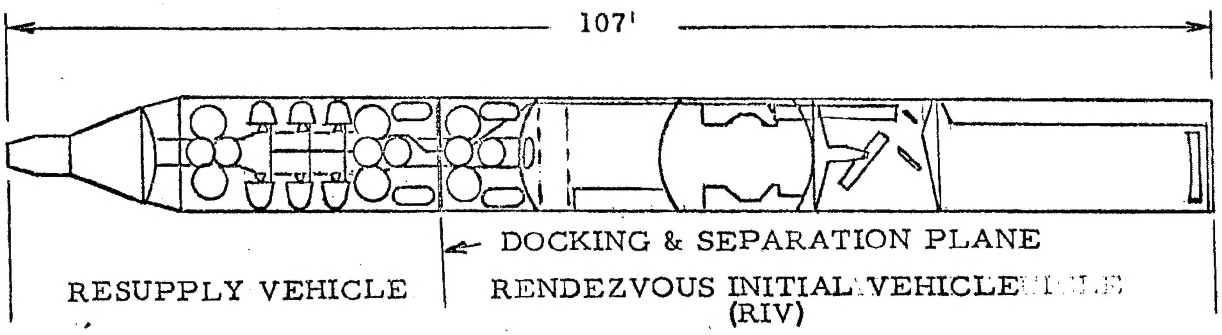
- CREW TRANSPORT VEHICLE
- ACTS PROPULSION
- PRIME POWER
- LIFE SUPPORT EXPENDABLES
- DATA RETURN SYSTEM
- SUBSYSTEM SPARES/REPLACEMENTS

RIV FUNCTIONS

- LIFE SUPPORT SYSTEM
- ATTITUDE CONTROL REF. ELECTRONICS
- COMMUNICATIONS AND DATA HANDLING
- ENVIRONMENTAL CONTROL
- PERFORMANCE DATA

2 MAN DUAL COMPARTMENT LABORATORY
CONFIGURATION AND PERFORMANCE SUMMARY
(COMBINED MISSION)

- CONFIGURATION

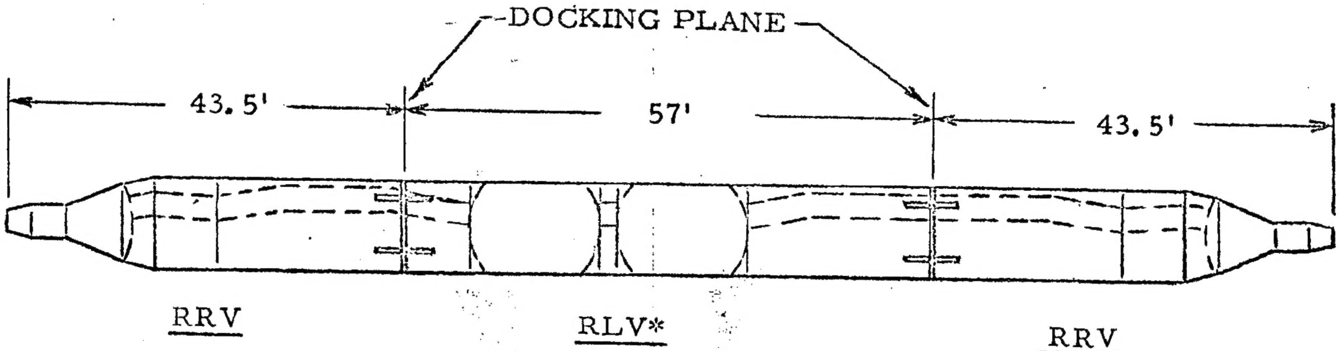


- PERFORMANCE DATA

TOTAL PRESSURIZED VOLUME (SHIRT SLEEVE ENVIRONMENT)	2,060 FT^3
AVAILABLE PRESSURIZED VOLUME FOR CREW	1,200 FT^3
AVAILABLE PRESSURIZED VOLUME FOR EXPERIMENT EQUIPMENT	210 FT^3
R.I.V. EXP. PAYLOAD CAPACITY ($i = 96.4^\circ$, 80/180 NM)	3,000 LBS
ELECTRICAL POWER (AVERAGE)	1,950 WATTS
RESUPPLY CYCLE	60 DAYS

D ~~SECRET~~ SPECIAL HANDLING

FUNCTION DISTRIBUTION
ORBITING CONFIGURATION



RRV FUNCTIONS (STORAGE END)

- o CREW TRANSPORT (STORAGE)

RLV FUNCTIONS

- o LIFE SUPPORT
- o ENVIRONMENTAL CONTROL
- o ACTS - REFERENCE
- o COMMUNICATIONS/DATA
- o BIO MED EQUIPMENT
- o EXPERIMENTS

RRV FUNCTIONS (ACTIVE END)

- o CREW TRANSPORT
- o ACTS - PROPULSION
- o PRIME ELECTRICAL POWER
- o LIFE SUPPORT EXPENDABLES
- o DATA RETURN SYSTEM
- o EXPERIMENTS
- o SPARE EQUIPMENT

D ~~SECRET~~

* RENDEZVOUS LABORATORY VEHICLE = R.O.V. LESS GEMINI B

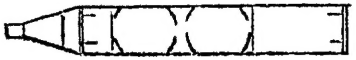
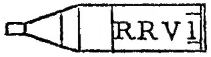
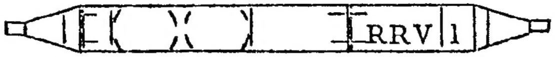
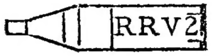
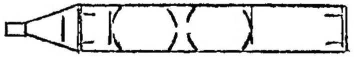
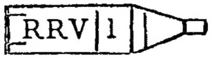
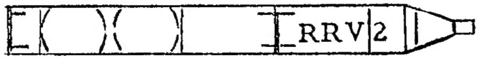
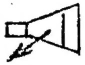
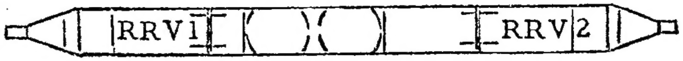
SPECIAL HANDLING

4

9/16/66

D ~~SECRET~~ SPECIAL HANDLING

4 MAN - DUAL COMPARTMENT CONCEPT
POSSIBLE RENDEZVOUS/RESUPPLY OPERATIONS

TIME LINE (DAY)	FUNCTION	CREW	CONFIGURATION
0-60	LAUNCH ROV & OPERATE	2	
60	LAUNCH RRV #1	2	
	RENDEZVOUS WITH ROV	4	
	DOCK & OPERATE ROV SYSTEM		
120	LAUNCH RRV #2	2	
	RENDEZVOUS WITH ROV		
	SEPARATE RRV #1 & STATION KEEP		
	DOCK RRV #2 ON P/L COMPARTMENT		
	SEPARATE GEMINI #1 & RETURN		
	DOCK RRV #1 ON ROV/GEM I. F.	4	
	OPERATE ROV SYSTEM		
180	LAUNCH RRV #3 & SUBS. (REPEAT RRV SEQUENCE)		SAME AS RRV #2 CONFIG.

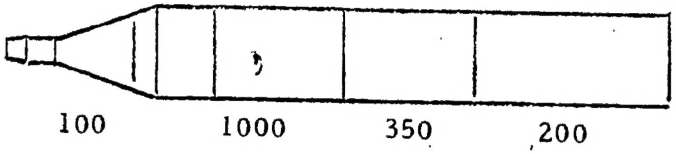
D ~~SECRET~~ SPECIAL HANDLING

3

ESTIMATED ELECTRICAL POWER REQUIREMENTS

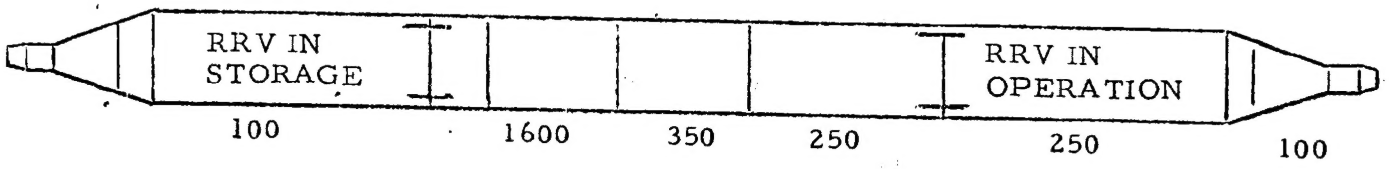
(WATTS)

○ 2 MAN DUAL COMPARTMENT VEHICLE - INTEGRAL LAUNCH



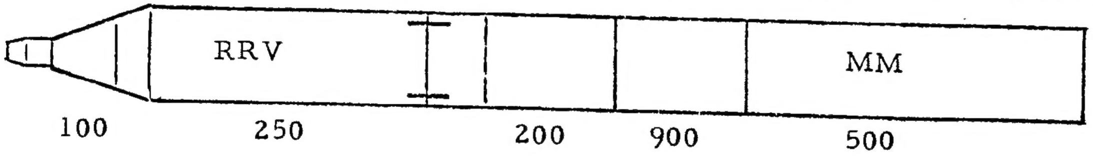
1650 WATTS

○ 4 MAN DUAL COMPARTMENT VEHICLE - RENDEZVOUS (BIO TEST) -



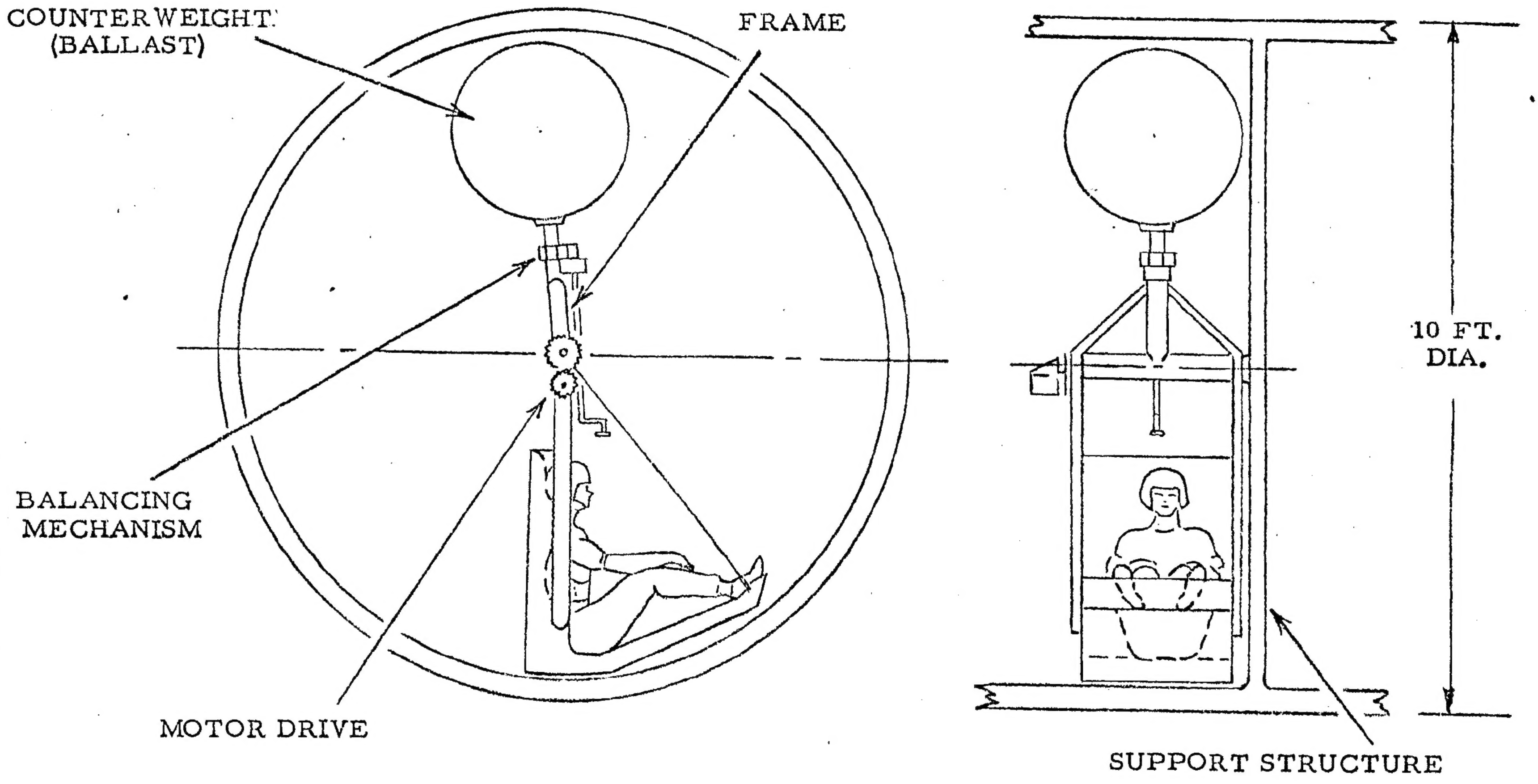
2000 WATTS

○ 2 MAN DUAL COMPARTMENT VEHICLE - RENDEZVOUS (COMBINED MISSION)



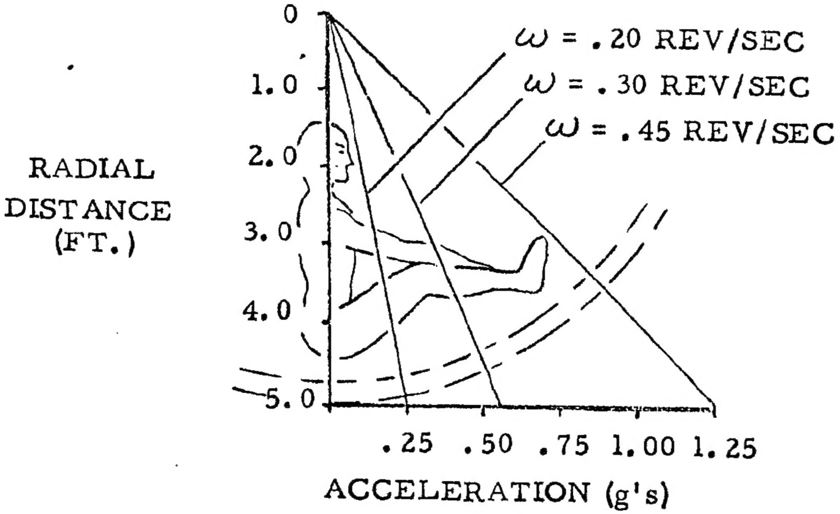
1950 WATTS

INTERNAL CENTRIFUGE CONCEPT



- WEIGHT PENALTY = 400 LBS. PLUS ATTITUDE CONTROL REQUIREMENTS

INTERNAL CENTRIFUGE
ACCELERATION & ATTITUDE CONTROL FUEL CONSUMPTION



- FUEL CONSUMPTION FOR SPIN CYCLE DURATION - 600 SEC.

• SPIN/DESPIN	1.0
• GYRO COUPLING	0.3
TOTAL	1.3 LBS.